



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care



NATIONAL
GUIDELINE
CLEARINGHOUSE

General

Guideline Title

Comprehensive adult eye and vision examination.

Bibliographic Source(s)

American Optometric Association (AOA). Comprehensive adult eye and vision examination. St. Louis (MO): American Optometric Association (AOA); 2015. 51 p. [126 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Optometric Association (AOA). Comprehensive adult eye and vision examination. St. Louis (MO): American Optometric Association (AOA); 2005. 37 p. [83 references].

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the strength of evidence (A–D) and clinical recommendation levels (Strong Recommendation, Recommendation, Consensus Recommendation) are presented at the end of the "Major Recommendations" field.

Comprehensive Adult Eye and Vision Examination

Examination Procedures*

Consensus-Based Action Statement: A comprehensive adult eye and vision examination should include, but is not limited to:

- Patient, family, and social history, including visual, ocular and general health, medication usage, and vocational and avocational visual requirements
- Measurement of visual acuity
- Preliminary examination regarding aspects of visual function and ocular health
- Determination of refractive status
- Assessment of ocular motility, binocular vision, and accommodation, as appropriate, based on patient's age, visual signs and symptoms, and visual requirements
- Ocular health assessment, including evaluation of the anterior and posterior segment, peripheral retina, measurement of intraocular pressure, and visual field testing

- Systemic health assessment, as indicated.

(See Appendix Table 1 in the original guideline document.)

See the "Potential Benefits" field for a listing of potential benefits and harms of testing.

- Evidence Quality: There is a lack of published research to support or refute the use of all of the tests and/or assessments included in this recommendation.
- Benefit and Harm Assessment: Implementation of this recommendation is likely to result in the enhanced ability to effectively diagnose any eye or vision problem in adults. The benefits of this recommendation were established by expert consensus opinion.

*Note: Specific tests and procedures listed are provided as examples only and are not a complete listing of testing options. Clinicians should remain alert for new and emerging technologies, instruments and procedures, and incorporate them into the clinical examination, as appropriate.

Consensus-Based Action Statement: Any systemic medication or supplement used by patients should be investigated by their eye doctor for ocular risk factors or side effects.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementation of this recommendation is likely to assist eye doctors in determining the potential risks or side effects any medication or supplement may have on a patient's eye health or vision. The benefits of this recommendation were established by an expert consensus opinion.

Consensus-Based Action Statement: Pharmacologic dilation of the pupil is generally required for thorough stereoscopic evaluation of the ocular media, retinal vasculature, macula, optic nerve, and the peripheral retina.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementation of this recommendation would enhance the ability to diagnose ocular disease. Potential harms involve adverse reactions to drugs used for dilation.

Evidence-Based Action Statement: Because of possible variations in measurements obtained when using various intraocular pressure (IOP) testing instruments/techniques, eye doctors should consider taking more than one reading with the same instrument to reduce measurement error (Carbonaro et al., 2010).

- Evidence Quality: Grade C, Observational Study. No randomized controlled trials or systematic reviews were identified regarding the variability of IOP measurements.
- Clinical Recommendation Level: Recommendation. Eye doctors should generally follow this recommendation, but should remain alert for new information.
- Evidence Statement: There can be significant differences in the measurements obtained using different IOP testing methods. The clinician needs to be aware of these differences when using any particular instrument or technique. Evidence Quality: Grade C.
- Potential Benefits: Preventing and/or minimizing vision loss through early diagnosis, treatment, and management of ocular health conditions.
- Potential Risks/Harms: Allergic responses to diagnostic pharmaceutical agents or other adverse effects.
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct cost of testing as a component of a comprehensive eye and vision examination.
- Value Judgments: Repeat measurement of IOP using the same instrument/technique can reduce the chances of measurement error and help ensure appropriate patient diagnosis and management.
- Role of Patient Preferences: Small.
- Intentional Vagueness: Specific type of IOP instruments/techniques are not specified as they are considered practice of medicine decisions.
- Gaps in Evidence:
 - Research is needed to support the validity, reliability and repeatability of IOP tests/instruments currently used to diagnose glaucoma in adult patients.
 - Research is needed to support the validity, reliability and repeatability of new or emerging technologies/instrumentation in the diagnosis of glaucoma.

Evidence-Based Action Statement: Eye doctors should not rely on a single, normal confrontation visual field test result as proof that a field loss is not present and should conduct threshold visual field testing on patients if there is a clinical suspicion of a visual field defect. (Kerr et al., 2010; Shahinfar, Johnson, & Madsen, 1995)

- Evidence Quality: Grade B, Cohort study and Grade C, Diagnostic study. No randomized controlled trials or systematic reviews were identified regarding the sensitivity of confrontation visual field testing.

- Clinical Recommendation Level: Recommendation. Eye doctors should generally follow this recommendation, but should remain alert for new information.
- Evidence Statements:
 - The diagnostic accuracy of confrontation visual field testing is low for mild to moderate visual field defects and when performed as a standalone test. The sensitivity of confrontation testing can be improved by using two testing procedures (e.g., kinetic testing with a 5 mm red target along with static finger wiggle testing). Formal perimetry should be conducted if there is a suspicion of a visual field defect. Evidence Quality: Grade B.
 - When only an individual test is performed, confrontation visual field testing is sensitive for only very dense visual field defects. However, there is high positive predictive value when a confrontation visual field loss is demonstrated. Therefore confrontation visual field testing is not without value. Clinicians should not rely on a negative confrontation result as proof that a field loss is not present. Evidence Quality: Grade C.
- Potential Benefits: Decreased likelihood that a visual field defect will be missed.
- Potential Risks/Harms: No adverse effects of testing.
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct cost of testing as a component of a comprehensive eye and vision examination
- Value Judgments: The sensitivity of confrontation visual field testing can vary depending on the type and location of field loss and the method used to perform the testing.
- Role of Patient Preferences: Small.
- Intentional Vagueness: Specific types of confrontation visual field testing are not stated, as they are considered practice of medicine decisions.
- Gaps in Evidence:
 - Research is needed to support the validity, reliability and repeatability of confrontation visual field testing in adult patients.
 - Research is needed to support the validity, reliability and repeatability of new or emerging technologies in visual field testing.

Management

Patient Counseling and Education

Consensus-Based Action Statement: At the conclusion of an eye and vision examination, the eye doctor should explain the diagnosis to the patient, relate it to the patient's symptoms, and discuss a treatment plan and prognosis.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementing this recommendation is likely to increase patient understanding of any diagnosed eye or vision problems and improve compliance with any recommended treatment. The benefits of this recommendation were established by expert consensus opinion.

Consensus-Based Action Statement: Persons who will undergo or have undergone ocular surgery or other specialty care should be counseled by their eye doctor regarding their ongoing need for periodic comprehensive eye and vision examinations.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementing this recommendation is likely to increase patient understanding of the need for ongoing primary eye and vision care services after eye surgery or other specialized care. The benefits of this recommendation were established by expert consensus opinion.

Evidence-Based Action Statement: Eye doctors should ask about and document their patients' smoking status and inform them about the benefits to their eyes, vision, and overall health, through smoking cessation (Christen et al., 2000; Klein et al., 2014).

- Evidence Quality: Grade B, Cohort studies. No randomized controlled trials or systematic reviews were identified regarding the effects of smoking on eye health and vision.
- Clinical Recommendation Level: Recommendation. Eye doctors should generally follow this recommendation, but should remain alert for new information.
- Evidence Statements:
 - Cigarette smoking is a major modifiable risk factor for cataract and age-related macular degeneration. Given the effect of smoking on overall health, and especially on vision, counseling to reduce or eliminate tobacco use is needed. Evidence Quality: Grade B.
 - A physically active lifestyle, occasional drinking, and not smoking are modifiable behaviors associated with a reduced risk for developing visual impairment. Patients should be counseled about these modifiable risk factors to help prevent or decrease future vision loss. Evidence Quality: Grade B.

- Potential Benefits: Counseling and educating patients about the potential impact of smoking may help maintain ocular and systemic health, and visual function.
- Potential Risks/Harms: None
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct cost of counseling as part of a comprehensive eye and vision examination
- Value Judgments: Patients who smoke may benefit from counseling on smoking cessation to reduce the risk of cataracts, age-related macular degeneration, and ocular surface disorders.
- Role of Patient Preferences: Large.
- Intentional Vagueness: Specific type/form of counseling is not stated as it is patient specific.
- Gaps in Evidence: Research is needed to evaluate the relationship between vision loss and smoking.

Consensus-Based Action Statement: Individuals performing high-risk activities, monocular persons, and those with previous eye trauma or eye surgery should be strongly advised by their eye doctor to wear appropriate eye protection with impact resistant properties.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementing this recommendation is likely to increase patients' use of eye protection based on their personal risk factors. The benefits of this recommendation were established by expert consensus opinion.

Consensus-Based Action Statement: Exposure to ultraviolet (UV) radiation is a risk factor for disorders of the eye. Eye doctors should advise their adult patients about the benefits of the regular use of sunglasses that effectively block at least 99 percent of ultraviolet A (UVA) and ultraviolet B (UVB) radiation and the use of hats with brims when outdoors.

- Evidence Quality: There is a lack of sufficient evidence to define the specific effects of UV on the eyes.
- Benefit and Harm Assessment: Implementing this recommendation is likely to decrease patient risk of eye health problems from chronic exposure to UV radiation. The benefits of this recommendation were established by expert consensus opinion.

Consensus-Based Action Statement: Eye doctors should be aware of their patients' dietary and supplementation practices and counsel them on good nutrition for eye health.

- Evidence Quality: Available research confirms the importance of good nutrition for specific aspects of eye health, but it does not support or refute the use of a broader evidence-based approach to dietary and supplemental practices.
- Benefit and Harm Assessment: Implementing this recommendation is likely to help patients understand the benefits to their eyes and vision by improving their nutritional habits. The benefits of this recommendation were established by expert consensus opinion.

Coordination and Frequency of Care

Consensus-Based Action Statement: Comprehensive eye and vision examinations are recommended at least every two years for asymptomatic, low-risk persons ages 18 through 39 years to evaluate changes in eye and visual function, and provide for early detection of sight-threatening eye and systemic health problems.

See the "Potential Benefits" field for a listing of potential benefits and harms of testing.

- Evidence Quality: There is lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementing this recommendation is likely to result in earlier diagnosis of eye and vision problems and the prevention or reduction in vision loss in this age group. The benefits of this recommendation were established by expert consensus opinion.

Evidence-Based Action Statement: Comprehensive eye and vision examinations are recommended at least every two years for asymptomatic, low-risk persons 40 through 64 years of age to evaluate changes in eye and visual function, and provide for the early detection of eye diseases, which may lead to significant vision loss, and systemic conditions that may affect health or vision (Rahi, Peckham, & Cumberland, 2008; He et al., 2014; Li et al., 2013).

- Evidence Quality: Grade B, Cohort studies. No randomized controlled trials or systematic reviews were identified regarding the recommended frequency of examination.
- Clinical Recommendation Level: Recommendation. Eye doctors should generally follow this recommendation, but should remain alert for new information.
- Evidence Statements:
 - A significant portion of working age adults have visually significant undiagnosed refractive errors. Detection of refractive errors in working age adults could benefit their working lives. Evidence Quality: Grade B.

- Near vision problems due to refractive errors are a significant cause of reduced vision among people of working age. Evidence Quality: Grade B.
- Periodic eye examinations are recommended for the timely detection and treatment of glaucoma, age-related macular degeneration (AMD), cataracts and many other eye conditions to prevent irreversible vision loss in person 40 to 65 years of age. Persons 40 to 65 years of age, with and without visual impairment, who had an eye exam in the prior year generally had better vision. Evidence Quality: Grade B.
- Potential Benefits:
 - Optimizing visual function through diagnosis, treatment, and management of refractive, ocular motor, accommodative and binocular vision problems.
 - Preventing and/or minimizing vision loss through early diagnosis, treatment, and management of ocular health conditions.
- Potential Risks/Harms: Temporary visual disturbances resulting from dilation, allergic responses to diagnostic pharmaceutical agents, or other adverse effects.
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct cost of testing.
- Value Judgments: Periodic eye and vision examinations are an important means to prevent vision loss and maintain and improve health-related quality of life.
- Role of Patient Preferences: Moderate.
- Intentional Vagueness: None.
- Gaps in Evidence: Research is needed to determine the optimum frequency of eye examinations to prevent vision loss and maintain visual function and eye health.

Evidence-Based Action Statement: Individuals 60 years of age and older with central and/or peripheral vision loss should be counseled by their eye doctor about the potential for an increased risk of falls (Freeman et al., 2007; Lord & Dayhew, 2001; Patino et al., 2010).

- Evidence Quality: Grade B, Cohort studies. No randomized controlled trials or systematic reviews were identified regarding the loss of visual field and the potential for an increased risk of falls in older adults.
- Clinical Recommendation Level: Recommendation. Eye doctors should generally follow this recommendation, but should remain alert for new information.
- Evidence Statements:
 - Visual field defects, as measured by full field testing of at least 60 degrees, are a risk factor for falls. However, reduced visual acuity, contrast sensitivity or stereoacuity were not found to be associated with falls. Evidence Quality: Grade B.
 - Binocular depth perception, and good visual acuity and contrast sensitivity are associated with a decreased risk for falls. Older individuals should be tested for these vision functions in an effort to decrease their risk of falls. Evidence Quality: Grade B.
 - Central and peripheral visual impairment increases the risk for falls and falls with injury. Peripheral vision impairment is associated with increased risk of tripping over obstacles and the use of bifocals and being obese are also significant risk factors for falls. Evidence Quality: Grade B.
- Potential Benefits: Counseling and educating patients on current conditions and preventive care in order to maintain ocular and systemic health and visual function.
- Potential Risks/Harms: None.
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct cost of counseling as part of a comprehensive eye and vision examination.
- Value Judgments: Patients with central and/or peripheral vision loss may benefit from falls prevention counseling and intervention when initially diagnosed.
- Role of Patient Preferences: Moderate.
- Intentional Vagueness: Specific type/form of counseling is not stated, as it is patient specific.
- Gaps in Evidence: Research is needed to evaluate the relationship between vision loss and falls.

Evidence-Based Action Statement: Annual comprehensive eye and vision examinations are recommended for persons 65 years of age or older for the diagnosis and treatment of sight-threatening eye conditions and the timely correction of refractive errors (Coleman et al., 2006; Sloan et al., 2005; Picone et al., 2004; Lord & Dayhew, 2001).

- Evidence Quality: Grade B, Randomized Controlled Trial and Cohort studies
- Clinical Recommendation Level: Strong Recommendation. Eye doctors should follow this recommendation unless clear and compelling rationale for an alternative approach is present. The quality of evidence provides a clear reason to make a recommendation.

- Evidence Statements:
 - Correction of refractive error improves vision specific quality of life in persons over age 65. Evidence Quality: Grade B.
 - Persons ≥ 65 years of age who have regular eye examinations experience less decline in vision and improved functional status. Evidence Quality: Grade B.
 - Individuals ≥ 65 years of age who have annual eye examinations have a lower probability of a reduction in reading ability and of developing legal blindness or low vision. Evidence Quality: Grade B.
 - Binocular depth perception, and good visual acuity and contrast sensitivity are associated with a decreased risk for falls. Older individuals should be tested for these vision functions in an effort to decrease their risk of falls. Evidence Quality: Grade B.
- Potential Benefits:
 - Optimizing visual function through diagnosis, treatment, and management of refractive, ocular motor, accommodative, and binocular vision problems.
 - Preventing and/or minimizing vision loss through early diagnosis, treatment, and management of ocular health conditions.
- Potential Risks/Harms: Temporary visual disturbances resulting from dilation, allergic responses to diagnostic pharmaceutical agents, or other adverse effects.
- Benefit and Harm Assessment: Benefits significantly outweigh harms.
- Potential Costs: Direct costs of testing.
- Value Judgments: Annual eye and vision examinations can help maintain visual function and reduce the likelihood of vision loss from eye disease.
- Role of Patient Preferences: Moderate.
- Intentional Vagueness: None.
- Gaps in Evidence: Research is needed to determine the optimum frequency of eye examinations in persons 65 years of age or older to prevent vision loss and maintain visual function and eye health.

Consensus-Based Action Statement: Adult patients should be advised by their eye doctor to seek eye care more frequently than the recommended re-examination interval (see table below) if new ocular, visual, or systemic health problems develop.

See the "Potential Benefits" field for a listing of potential benefits and harms of testing.

- Evidence Quality: There is a lack of published research to support or refute the use of this recommendation.
- Benefit and Harm Assessment: Implementing this recommendation is likely to increase patient understanding of the need for and benefits of more frequent vision examination based on personal risk factors. The benefits of this recommendation were established by expert consensus opinion.

Recommended Eye Examination Frequency for Adult Patients

| Patient Age (Years) | Asymptomatic/Low-Risk | At-Risk |
|---------------------|--------------------------|--------------------------------------|
| 18 through 39 | At least every two years | At least annually, or as recommended |
| 40 through 64 | At least every two years | At least annually, or as recommended |
| 65 and older | Annually | At least annually or as recommended |

Definitions

Strength of Evidence

| Grade | Strength of Evidence |
|----------|--|
| A | Data derived from well-designed, randomized clinical trials (RCTs), systematic reviews; meta-analyses; or diagnostic studies (Grade A) of relevant populations with a validated reference standard. Grade A diagnostic studies do not have a narrow population or use a poor reference standard and are not case control studies of diseases or conditions. |
| B | RCTs with weaker designs; cohort studies (retrospective or prospective); or diagnostic studies (Grade B). Grade B diagnostic studies have only one of the following: a narrow population or the sample used does not reflect the population to whom the test would apply or uses a poor reference standard or the comparison between the test and reference standard is not blinded or are case control studies of diseases or conditions. |
| C | Studies of strong design, but with substantial uncertainty about conclusions, or serious doubts about generalization, bias, research design, or sample size. Nonrandomized trials; case control studies (retrospective or prospective); or diagnostic studies (Grade C). |

| Grade | Strength of Evidence |
|----------|--|
| | Grade C diagnostic studies have at least 2 or more of the following: a narrow population or the sample used does not reflect the population to whom the test would apply or uses a poor reference standard or the comparison between the test and reference standard is not blinded or are case control studies of diseases or conditions. |
| D | Cross sectional studies; case reports/series; reviews; position papers; expert opinion; or reasoning from principle. |

Clinical Recommendation Levels

Strong Recommendation: Eye doctors should follow this recommendation unless clear and compelling rationale for an alternative approach is present. The quality of evidence provides a clear reason to make a recommendation.

Recommendation: Eye doctors should generally follow this recommendation, but should remain alert for new information. The quality of evidence is not as strong, but the benefits exceed the harms or vice versa.

Consensus Recommendation: Eye doctors should be aware of this recommendation, but be flexible in their clinical decision-making and remain alert for new information. No clear advantage has been demonstrated for one approach versus another. There is lack of pertinent evidence and an unclear balance between benefit and harm.

Clinical Algorithm(s)

An algorithm titled "Comprehensive Adult Eye and Vision Examination: a Flowchart" is provided as Appendix Figure 1 in the original guideline document.

Scope

Disease/Condition(s)

- Eye and vision disorders, including refractive errors (myopia, hyperopia, astigmatism), presbyopia, cataracts, glaucoma, diabetic retinopathy, age-related macular degeneration, and dry eye disease
- Systemic diseases with ocular manifestations

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Clinical Specialty

Optometry

Preventive Medicine

Intended Users

Health Care Providers

Guideline Objective(s)

- To describe appropriate examination procedures for evaluation of the eye health, vision status, and ocular manifestations of systemic disease of adult patients to reduce the risk of vision loss and provide clear, comfortable vision
- To provide recommendations for timely diagnosis, intervention, and, when necessary, referral for consultation with, or treatment by, another health care provider
- To assist eye care providers in achieving the following objectives:
 - Recommend an appropriate timetable for eye and vision examinations for adult patients (age 18 or older)
 - Select appropriate examination procedures for adult patients
 - Effectively examine the eye health, vision status, and ocular manifestations of systemic disease of adult patients
 - Minimize or avoid the adverse effects of eye and vision problems in adults through prevention, early detection, education, treatment, and management
 - Inform and educate individuals and other health care practitioners about the need for, and frequency of comprehensive adult eye and vision examinations

Target Population

Adult patients (18 years of age or older)

Interventions and Practices Considered

Diagnosis/Evaluation/Risk Assessment

1. Examination procedures
 - Patient history
 - Visual acuity
 - Preliminary examination
 - Refraction
 - Ocular motility, binocular vision, and accommodation
 - Ocular and systemic health assessment
 - Supplemental testing
 - Assessment and diagnosis
2. Investigation of medications or supplements being taken

Management/Prevention

1. Patient counseling and education
 - Smoking cessation
 - Use of eye protection
 - Protection from ultraviolet (UV) exposure
 - Monitoring of dietary supplements
2. Coordination and frequency of care

Major Outcomes Considered

- Accuracy of diagnostic tests
- Effectiveness of comprehensive eye and vision examination
- Risks and harms

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Clinical questions to be addressed in the guideline were identified and refined during an initial meeting of the Guideline Development Group (GDG) and served as the basis for a search of the clinical and research literature.

An English language literature search for the time period January 2005 to December 2014 was conducted by several trained researchers. If the search did not produce results, the search parameters were extended an additional 5 years, and subsequently 10 years back. In addition, a review of selected earlier research publications was conducted based on previous versions of this guideline.

The literature search was conducted using PubMed, Visionet, Visioncite, and Cochrane databases. Additional Web site resources were used in the literature search process:

- Agency for Healthcare Research and Quality (AHRQ)
- American Academy of Ophthalmology
- American Optometric Association
- Canadian Ophthalmologic Society
- Centers for Disease Control and Prevention (CDC), National Center for Health Statistics
- Elsevier
- Google Scholar
- Mayo Clinic
- Medical Expenditure Panel Survey (MEPS)
- National Eye Institute
- National Guideline Clearinghouse (AHRQ)
- National Institute for Health and Care Excellence (British)
- Vision Health Initiative (of the CDC)
- World Health Organization

See the "Literature Search Process" document (see the "Availability of Companion Documents" field) for search terms.

Inclusion/Exclusion Criteria for Study Searches for Evidence-based Clinical Practice Guidelines

Inclusion Criteria (must meet all):

1. English studies
2. Study addresses the clinical question
3. Paper meets the age group being addressed (0 to 18 years for pediatrics and 18 and beyond for adults)
4. Inclusion as a graded clinical recommendation meets a grade of A or B (see the "Rating Scheme for the Strength of the Evidence" field; C and D level of evidence may be included in background information only and identified as a consensus statement when applicable)

Exclusion Criteria (meeting any of the below):

1. Non-English studies
2. Animal studies
3. Studies outside of the patient age range
4. Studies not addressing any topic of the clinical questions searched

All references meeting the criteria were reviewed to determine their relevance to the clinical questions addressed in the guideline.

1,705 abstracts were identified through literature search process and 309 abstracts were reviewed for full article assessment.

Number of Source Documents

25 articles (yielded 41 clinical statements and recommendations)

See the flow chart in Section VI of the original guideline document for details of the article selection process.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence

| Grade | Strength of Evidence |
|-------|---|
| A | Data derived from well-designed, randomized clinical trials (RCTs), systematic reviews; meta-analyses; or diagnostic studies (Grade A) of relevant populations with a validated reference standard. Grade A diagnostic studies do not have a narrow population or use a poor reference standard and are not case control studies of diseases or conditions. |
| B | RCTs with weaker designs; cohort studies (retrospective or prospective); or diagnostic studies (Grade B). Grade B diagnostic studies have only one of the following: a narrow population or the sample used does not reflect the population to whom the test would apply or uses a poor reference standard or the comparison between the test and reference standard is not blinded or are case control studies of diseases or conditions. |
| C | Studies of strong design, but with substantial uncertainty about conclusions, or serious doubts about generalization, bias, research design, or sample size. Nonrandomized trials; case control studies (retrospective or prospective); or diagnostic studies (Grade C). Grade C diagnostic studies have at least 2 or more of the following: a narrow population or the sample used does not reflect the population to whom the test would apply or uses a poor reference standard or the comparison between the test and reference standard is not blinded or are case control studies of diseases or conditions. |
| D | Cross sectional studies; case reports/series; reviews; position papers; expert opinion; or reasoning from principle. |

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Each article was assigned to two clinicians who independently reviewed and graded the strength of evidence for the article, based on a previously defined system for grading quality (see the "Rating Scheme for the Strength of the Evidence" field). The results are recorded on an Evidence and Recommendation Grading Sheet and recorded by the American Optometric Association (AOA) staff for transparency documentation.

If both readers are in agreement with the strength of evidence grade – each independently grading the paper (+/-) the A-B/C-D line – the grades are accepted. If discrepancies are found in the grading results, the article is assigned to an independent third clinician by AOA staff for review and grading.

All evidence grades are reviewed at the Articulation Meeting, and a final grade is determined by vote of the Guideline Development Reading Group (GDRG).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline was developed by the American Optometric Association (AOA) Evidence-Based Optometry Guideline Development Group (GDG). Clinical questions to be addressed in the guideline were identified and refined during an initial meeting of the GDG and served as the basis for a search of the clinical and research literature.

During three articulation meetings of the Evidence-Based Optometry Guideline Development Reading Group (GDRG), all evidence was reviewed and clinical recommendations were developed. Grading for the recommendations was based on the quality of the research and the benefits and risks of the procedure or therapy recommended. Where direct scientific evidence to support a recommendation was weak or lacking, a consensus of the Evidence-Based Optometry Subcommittee members was required to approve a recommendation (see the "Rating Scheme for the Strength of the Recommendations" field).

See the original guideline document for "AOA's 14 Steps to Evidence-Based Clinical Practice Guideline Development" for a description of all steps involved in guideline development.

Rating Scheme for the Strength of the Recommendations

Clinical Recommendation Levels

Strong Recommendation: Eye doctors should follow this recommendation unless clear and compelling rationale for an alternative approach is present. The quality of evidence provides a clear reason to make a recommendation.

Recommendation: Eye doctors should generally follow this recommendation, but should remain alert for new information. The quality of evidence is not as strong, but the benefits exceed the harms or vice versa.

Consensus Recommendation: Eye doctors should be aware of this recommendation, but be flexible in their clinical decision-making and remain alert for new information. No clear advantage has been demonstrated for one approach versus another. There is lack of pertinent evidence and an unclear balance between benefit and harm.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

At the Draft Reading Meeting of the Evidence-Based Optometry Guideline Development Group (GDG), the guideline document was reviewed and edited and the final draft was reviewed and approved by the GDG by conference call. The final draft of the guideline was then made available for peer and public review for 30 days for numerous stakeholders (individuals and organizations) to make comments. All suggested revisions were reviewed, and, if accepted by the GDG, incorporated into the Guideline.

See the original guideline document for "AOA's 14 Steps to Evidence-Based Clinical Practice Guideline Development" for a description of all steps involved in drafting and reviewing the guideline document.

Evidence Supporting the Recommendations

References Supporting the Recommendations

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their relation to central corneal thickness. *Eye (Lond)*. 2010 Jul;24(7):1165-70. [PubMed](#)

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Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for evidence-based recommendations (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Potential Benefits of Testing

The potential benefits of a comprehensive adult eye and vision examination may include:

- Optimizing visual function through diagnosis, treatment and management of refractive, ocular motor, accommodative and binocular vision problems
- Improving quality of life by preventing and/or minimizing vision loss through early diagnosis, treatment and management of ocular health conditions
- Detecting systemic disease and referral for appropriate care
- Counseling and educating patients on current conditions and preventive care to maintain ocular and systemic health and visual function

See also the "Potential Benefits" sections in the "Major Recommendations" field for specific benefits of evidence-based recommendations.

Potential Harms

Potential Harms of Testing

Potential harms associated with a comprehensive adult eye and vision examination may include:

- Patient anxiety about testing procedures or resulting diagnosis
- Adverse ocular and/or systemic reactions
- Temporary visual disturbances or allergic responses to diagnostic pharmaceutical agents or materials used
- Missed or misdiagnosis of eye health or vision problems
- Unnecessary referral or treatment

See also the "Potential Risks/Harms" sections in the "Major Recommendations" field for specific risks or harms for evidence-based recommendation.

Qualifying Statements

Qualifying Statements

- Recommendations made in this guideline do not represent a standard of care. Instead, the recommendations are intended to assist the clinician in the decision-making process. Patient care and treatment should always be based on a clinician's independent professional judgment, given the individual's circumstances, and state laws and regulations.
- The information in this guideline is current to the extent possible as of the date of publication.
- This Guideline describes the optometric examination for patients 18 years of age or older. The individual components are described in general terms because the order and methods of testing vary from practitioner to practitioner, and change as new technology is developed and is made available in the clinical setting. The examination components described are not intended to be all-inclusive. Professional judgment and individual patient symptoms and findings may significantly influence the nature and course of the examination. The examination process may also vary from that delineated in this Guideline according to patient cooperation and comprehension, and the examination setting. For example, professional judgment may dictate modification of the examination for the developmentally delayed or frail adult, or for the adult in an institutional setting such as an extended care facility.

Implementation of the Guideline

Description of Implementation Strategy

Effective multifaceted implementation strategies targeting all relevant populations affected by clinical practice guidelines (CPGs) should be employed by implementers to promote adherence to trustworthy guidelines.

American Optometric Association (AOA) Process:

1. The AOA has formed a Comprehensive Adult Eye and Vision Examination Guideline Translation Team, a subgroup of the Health Promotions Committee (HPC).
2. This team will consist of HPC members, OD and MD specialists, patient and patient advocates.
3. Their goal is to develop and implement methods to translate the clinical practice guideline into patient care.
4. These methods may include:
 - On-line courses for clinical education
 - Regional classes to educate clinicians
 - Public Web site

Implementation Tools

Clinical Algorithm

Patient Resources

Quick Reference Guides/Physician Guides

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

American Optometric Association (AOA). Comprehensive adult eye and vision examination. St. Louis (MO): American Optometric Association (AOA); 2015. 51 p. [126 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

Guideline Developer(s)

American Optometric Association - Professional Association

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Guideline Committee

American Optometric Association (AOA) Evidence-based Optometry Guideline Development Group

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American Optometric Association (AOA) Evidence-based Optometry Guideline Development Group

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Financial Disclosures/Conflicts of Interest

All Committee, Guideline Development Group, and other guideline participants provided full written disclosure of conflicts of interest prior to each meeting and prior to voting on the strength of evidence or clinical recommendations contained within the guideline.

No financial relationships or conflicts of interest relative to this guideline were present.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Optometric Association (AOA). Comprehensive adult eye and vision examination. St. Louis (MO): American Optometric Association (AOA); 2005. 37 p. [83 references].

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the [American Optometric Association \(AOA\) Web site](#) .

Availability of Companion Documents

The following are available:

- Comprehensive adult eye and vision examination. Quick reference guide. St. Louis (MO): American Optometric Association (AOA); 2015 May. 7 p. Available from the [American Optometric Association \(AOA\) Web site](#) .
- Evidence-based clinical practice guideline. Comprehensive adult eye and vision examination. Literature search process. St. Louis (MO): American Optometric Association (AOA); 2015 May. 1 p. Available from the [AOA Web site](#) .
- The AOA's evidence-based process. St. Louis (MO); 2015 May. 1 p. Available from the [AOA Web site](#) .

Patient Resources

The following are available:

- Adult vision: 19 to 40 years of age. Available from the [American Optometric Association \(AOA\) Web site](#) .
- Adult vision: 41 to 60 years of age. Available from the [AOA Web site](#) .
- Adult vision: over 60 years of age. Available from the [AOA Web site](#) .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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